IN THE SPECIFICATION

REPLACEMENT SECTION, PAGE 1, BEFORE LINE 1

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Field of the Invention

This application is a continuation of Application No. 08/959,633 filed October 28, 1997, now U.S. Patent No. 6,451,178 B2.

REPLACEMENT SECTION, PAGE 2, BEGINNING LINE 16.

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According to the invention, the object is accomplished by a method of this kind as mentioned in the introduction ~~according to claim 1~~ in that electric power is applied to the plasma charge acting upon the sputter target to be evaporated by means of at least two electrodes arranged in the vicinity of each other in the plasma reaction space, and where electric power is selected such that oxide layers to be precipitated on the substrate to be coated are deposited at a coating rate of > 4 m/s, whereby during the coating process the substrate to be coated is arranged stationary in relation to the target material to be evaporated. A coating rate of > 40 ~~nm m/min~~ nm/min is proposed for substrates which during the coating process are to be moved in front of the sputter target as in so-called continuous systems. Metal oxide layers produced according to the method ~~characteristics of claim 1 or claim 2~~ of the invention exhibit, surprisingly enough, several advantages vis-à-vis metal oxide layers produced by conventional sputtering. Thus it was found that TiO_2 layers produced according to the invention had a refractive index **n** between 2.55 and 2.60. Conventional DC technique only produced **n** values between 2.35 and 2.45. Metal oxide layers having a high **n** value advantageously allow a thinner metal oxide layer than one produced by conventional methods in order to achieve an effect dependent on the refractory value. In addition, thinner metal oxide layers have the advantage of high light transmission and color neutrality in the visible spectrum. Moreover, thin metal oxide layers can be produced more cost-effectively than conventional metal oxide layers.

REPLACEMENT SECTION, PAGE 3, BEGINNING LINE 11

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Layers produced according to the invention also advantageously exhibit a very smooth surface~~, as indicated in claim 5~~. Surface structure morphology of metal oxide layers produced

according to the invention exhibits a very compact crystalline definition which demonstrates high resistance to chemically reactive substances. Metal oxide layers produced according to the invention are correspondingly more resistant to the effects of humidity than conventional sputter layers produced for example by means of a plasma discharge. Furthermore it was found that by using sputter plasma operated with alternating current the precipitated TiO_2 layers crystallized primarily in a reactive structure. Contrary to the anatase structure of the TiO_2 layer which primarily forms in DC sputter process, the rutile structure is temperature-stable up to 1855°C, while the anatase structure undergoes a phase conversion at 642°C and exhibits an unstable structure. It has been further shown that given equal plasma output, the process according to the invention achieves a sputter rate about 6 to 7 times higher than that of conventional DC sputter process.

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REPLACEMENT SECTION, PAGE 4, BEGINNING LINES 11

It has been shown to be advantageous for the production of layers according to the invention to select a frequency of the alternating current supplying the sputter plasma between 10k Hz and 80 kHz~~, as indicated in claim 8~~.

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Additional advantageous features of the method and possible uses of metal oxide layers according to the invention are characterized ~~in more detail in the subclaims~~ in the following description.

REPLACEMENT SECTION, PAGE 6, STARTING AT LINE 16

A TiO_2 layer produced by means of a reactive sputter process with a coating rate of 21 ~~nm m/sec~~ nm/sec as proposed according to the invention is shown in Figs. 3a and 3b. TiO_2 layer 14 (see Fig. 3b) has a thickness of about 500 nm and in comparison to the layer structure shown in Fig. 1b, exhibits only weakly defined and locally limited columnar TiO_2 microcrystallites. Surface 16 shown in Fig. 3a exhibits in places surface sites which have only a small depth of roughness. The crystalline composition of TiO_2 layer 14 shown in Figs. 3a, 3b, applied to a glass substrate, is evident in the Debye-Scherrer diagram (Fig. 4), which, beside the known anatase 101 structure (A_1), also shows the diffraction reflex R_1, which corresponds to the Bragg reflection in a 110 grid net plane of a TiO_2 layer crystallized in a rutile structure. The rutile

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structure therein corresponds to the areas of low surface roughness appearing in Fig. 3a, while in contrast, the anatase 110 structure corresponds to the island formations appearing in Fig. 3a.